Disease of the Sultans: metabolic syndrome in Ottoman dynasty

Sultanların hastalığı: Osmanlı hanedanında metabolik sendrom

Selçuk Dağdelen, Tomris Erbaş

Department of Endocrinology and Metabolism, Faculty of Medicine, Hacettepe University, Ankara, Turkey

ABSTRACT

Metabolic syndrome is generally considered as a complication of modernity. Here we searched for the presence of metabolic syndrome components among the Ottoman emperors who lived between 1258 and 1926. Collections of historical archives, which were published as books specifically about morbidity and mortality of Ottoman emperors were reviewed to diagnose metabolic syndrome according to modified criteria by American College of Endocrinology and American Association of Clinical Endocrinologists.

Nineteen of 36 dynasty members (53%) had fatal or non-fatal cardiovascular events. Twenty-nine of the dynasty (81%) members were either depicted as truncal obese or reported to have obesity. Thirteen emperors (36%) satisfied diagnostic criteria for metabolic syndrome, retrospectively. Overall, 42% of non-commanding emperors, but 26% of commanding-emperors (who were assumed to be athletically grown and physically more active) were found to have metabolic syndrome (p=0.553).

We suggest firstly here that sedentary palace lifestyle exacerbated metabolic syndrome in Ottoman dynasty especially in elderly members, thereafter complicated by cardiovascular events, even in pre-modern era. *(Anadolu Kardiyol Derg 2010; 10: 270-3)*

Key words: Ottoman, metabolic syndrome, obesity

ÖZET

Metabolik sendrom genellikle bir modernizm komplikasyonu olarak yorumlanmaktadır. Bu çalışmada 1258-1926 yılları arasında yaşamış Osmanlı Hanedan üyelerinde Metabolik Sendrom sıklığı araştırılmıştır. Veri kaynağı olarak, Osmanlı padişahlarının sağlık durumlarını dökümante eden basılmış kitaplar kullanılmıştır. Metabolik sendrom tanı kriteri olarak ACE-AAC kriterleri tercih edilmiştir. Görülmüştür ki, 36 padişahtan 19'unda (%53) fatal veya nonfatal kardiyovasküler olay bildirilmektedir. Hanedan üyelerinin %81'i, en az 1 kez abdominal obez olarak resmedilmiş ya da resmi saray kayıtlarına aşırı kilolu olarak kaydedilmiştir. Hanedan üyelerinin %36'sında retrospektif olarak, metabolik sendrom tanı kriterleri karşılanmaktadır. Ordunun başında sefere çıkan padişahların (daha atletik yetiştirildikleri ve daha eforlu hayatlar sürdükleri varsayılırsa) %42'si, ordunun başında sefere çıkmayanların ise %26'sında metabolik sendrom söz konusudur (p=0.553). Bu çalışmayla literatürde ilk kez, premodern çağlarda dahi sedanter yaşam ve aşırı beslenmeyle karakterize saray hayatının; Osmanlı Hanedanında metabolik sendrom ve kardiyovasküler hastalık ile birlikteliği ortaya konulmuştur. *(Anadolu Kardiyol Derg 2010; 10: 270-3)*

Anahtar kelimeler: Osmanlı hanedanı, metabolik sendrom, obezite

Introduction

Cause of Ghazi Sultan Mehmed Khan II's death is still a debate among historians. It is suggested that cause of his death was intentional poisoning (1, 2). In contrast, other authors disagree with the claims of poisoning, but argue for the possibility of type 2 diabetes mellitus and related renal failure and/or mesenteric vascular accident aggravated by unintentional opiate overdosage as the cause of his death (1). Arguments against possibility of poisoning mainly rely on two characteristics of Ghazi Sultan Mehmed Khan II's medical history recorded by his own physicians. First, he used to have suffered from recurrent

Address for Correspondence/Yazışma Adresi: Dr. Selçuk Dağdelen, Hacettepe Erişkin Hastanesi Morfoloji Binası Endokrin Bölümü, Sıhhiye 06100, Ankara, Turkey
Phone: +90 312 305 11 48 Fax: +90 312 311 67 68 E-mail: dagdelen@hacettepe.edu.tr

This study was presented at the IV. National Symposium on Metabolic Syndrome in Antalya, Turkey, 2007

Accepted/Kabul Tarihi: 15.03.2010

doi:10.5152/akd.2010.069

gout attacks. Second, while he was lean at his twenties, he gained weight at his fourties and became obese, and then he had severely lost weight during the last year of his life. Therefore, they suggest that, his death was not that much sudden as only to be explained by poisoning, rather he used to have chronic diseases which could be quite fatal in time (1).

To answer the question of whether Ghazi Sultan Mehmed Khan II had died of a murder or due to a cardiovascular event at a diabetic background is beyond the scope of that article. However, we have wondered about his (medical) family history in regard to cardiovascular risk. As the current and best way of defining multiple cardiovascular risk factors clustering in an individual or a population is to determine presence of metabolic syndrome, we aimed to document how prevalent was metabolic syndrome among Ottoman dynasty. Therefore, we have searched for the presence of metabolic syndrome components in Ottoman Emperors.

Metabolic syndrome in Ottoman Emperors

The diagnosis was based on collections of historical archive, which were published as books specifically about morbidity and mortality of Ottoman emperors (1, 2). American College of Endocrinology and American Association of Clinical Endocrinologists (ACE-AACE) criteria was used to diagnose metabolic syndrome (3). However due to lack of exact laboratory measurements of these historical subjects, numerical definitions of ACE-ACCE's criteria were modified and used as categorical variables according to their timely physicians' diagnosis. ACE-ACCE guideline does not specify minimum number of diagnostic criteria to be satisfied for diagnosis of metabolic syndrome, but refers the decision to the physician. If 1 of the diagnostic criteria defined by ACE-ACCE (i.e. hypertension, obesity, diabetes mellitus, dyslipidemia) was present, presence of at least another metabolic syndrome component or metabolic syndrome-related disorder (i.e. gout and obstructive sleep apnea) were looked for diagnosis of metabolic syndrome in our subjects. If at least two of the diagnostic criteria proposed by ACE-ACCE (i.e. hypertension, obesity, diabetes mellitus, dyslipidemia) were satisfied, the subject also defined as having metabolic syndrome.

Any individual depicted at least once as abdominal obese in official palace miniatures or described by his own timely palace physician as obese, was regarded as obese.

Although all of the dynasty members were natural commanders of the army, only 15 emperors commanded the army at a war, but 21 emperors never attended a war as a commander together with his army. It is generally assumed that commanding emperors were grown up as a warriors and good horse-riders and lived in a different lifestyle, which was more athletic than non-commanding emperors. So, sedentary lifestyle was indirectly determined by categorizing whether the emperor attended any war as a commander (commanding emperor) or not (non-commanding emperor) during his reign.

Ottoman dynasty is composed of 36 emperors. Nineteen of dynasty members (53%) were reported to have fatal or non-fatal cardiovascular events (heart failure, myocardial infarction, stroke). Twenty-nine of the dynasty (81%) members were either depicted as truncal obese or reported to have obesity by their own physicians (Fig. 1). Three of 7 emperors who had never been depicted or reported as obese were known to have tuberculosis.

Thirty-one of the dynasty members (86%) found to have at least 1, and 12 members (33%) found to have at least 2 of the metabolic syndrome components including gout attacks and obstructive sleep apnea.

Thirteen of Ottoman dynasty members (36%) were found to have metabolic syndrome according to modified ACE-ACCE criteria as described above. In regard to impact of sedentary lifestyle, 42% of non-commanding emperors, but 26 % of commanding-emperors were found to have metabolic syndrome (p=0.553). Emperors with metabolic syndrome had longer life-times, when compared to emperors lacking metabolic syndrome (60.8±6.3 versus 47.6±16.5 years respectively, p=0.002).

Conclusion

Metabolic syndrome is generally considered as a disease of modern times and modern populations. In other words, it is defined as complication of modernity, which brings about higher energy intake and lower energy consumption. Members of the Ottoman dynasty had lived between 1258 and 1926. As we firstly described here, members of Ottoman dynasty were affected by metabolic syndrome even in pre-modern era.

Prevalence of metabolic syndrome in Ottoman dynasty was 36% in our study and it was comparable with the prevalence in modern Turkish population, which was recently published by Kozan O et al., as 33% (4). Metabolic syndrome representing the same prevalence both in pre-modern and modern era in a given geographical area seems to be quite striking and requires further explanations.

Despite lack of a defined single gene defect, metabolic syndrome clusters in families (5). Environmental factors and lifestyle changes are well known triggers of the syndrome. It was strikingly documented here that physically more active emperors who had been grown up as warriors and attended any war as commanding his army, showed less likely to have metabolic syndrome when compared to non-commanding emperors who had spent most of their time in the palace with more sedentary style. Secondly, longevity in Ottoman dynasty shown to increase risk for metabolic syndrome as in modern era.

Any argument about the morbidity and mortality of historical personalities is complicated by lack of clear data and/or evidences that survive from history. That is the most striking limitation of our study.

We suggest firstly here that sedentary palace lifestyle exacerbated metabolic syndrome in-possibly genetically predisposed-Ottoman dynasty especially in elderly members, thereafter complicated by cardiovascular events, even in pre-modern era.

Conflict of interest: None declared.

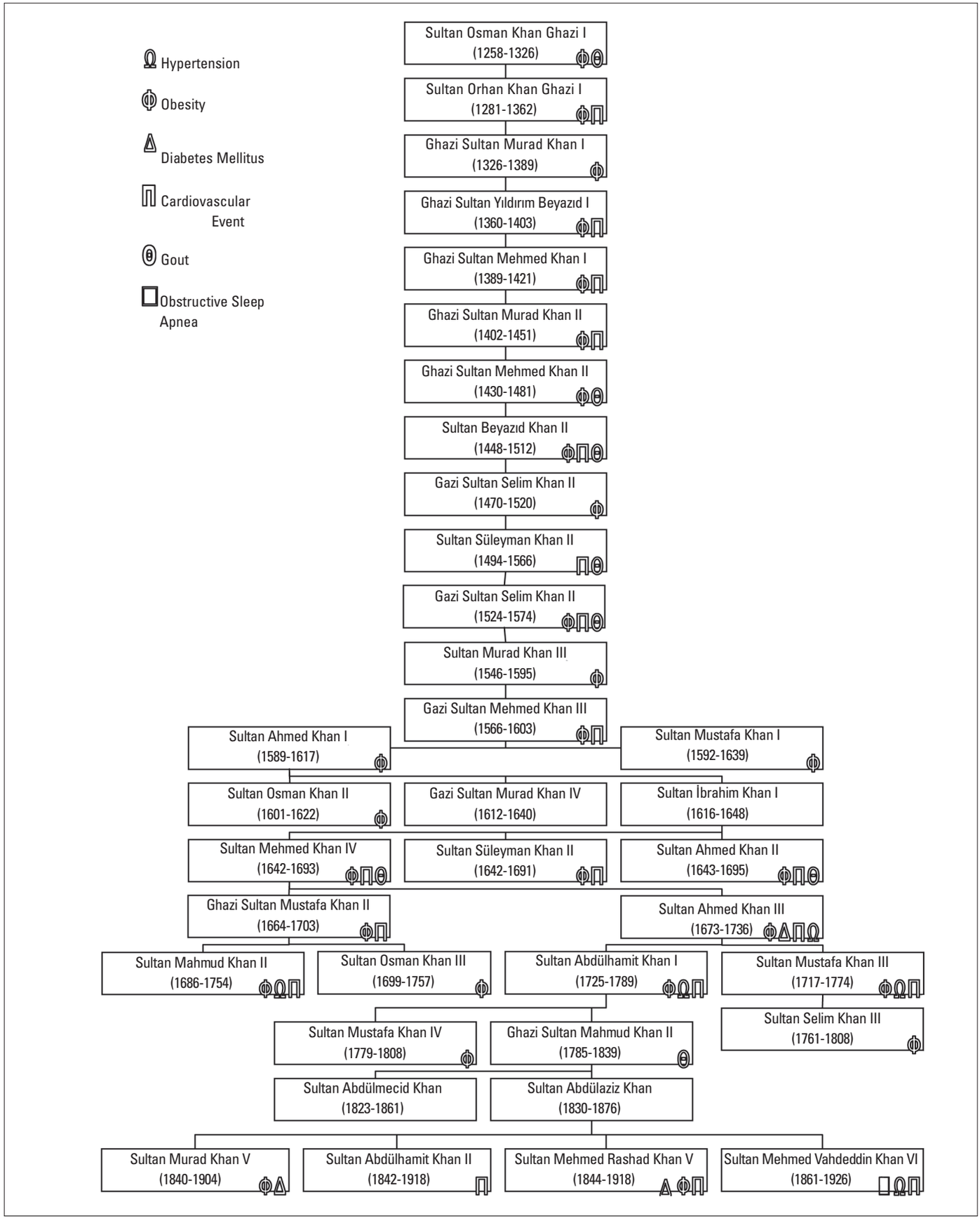

Figure 1. Simplified pedigree of Ottoman dynasty representing the presence of metabolic syndrome components

References

1. Barış İ. Osmanlı padişahlarının yaşamlarından kesitler, hastalıkları ve ölüm sebepleri. 1. baskı Ankara: Bilimsel Tip Yayinevi; 2002.
2. Uykucu E. Osmanlı padişahları nasıl öldüler, nasıl öldürüldüler? 1. baskı Yalova: Kitapevi Yayınları; 1998.
3. Einhorn D, Reaven GM, Cobin RH, Ford E, Ganda OP, Handelsman Y, et al. American College of Endocrinology Position Statement on the insulin resistance syndrome. Endocr Pract 2003; 9: 237-52.
4. Kozan O, Oğuz A, Abacı A, Erol C, Öngen Z, Temizhan A, et al. Prevalence of the metabolic syndrome among Turkish adults. Eur J Clin Nutr 2007; 61: 548-53.
5. Dallongeville J, Grupposo MC, Cottel D, Ferrières J, Arveiler D, Bingham A, et al. Association between the metabolic syndrome and parental history of premature cardiovascular disease. Eur Heart J 2006;27:722-8.